



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Darrel SUTTON, Arren GRANVILLE and
Mike BENOIT
Serial no. : 10/614,631
Filed : July 7, 2003
For : A METHOD OF PREVENTING AIR BYPASS IN
A FILTER BANK AND A FILTER ASSEMBLY
Group Art Unit : 1724
Examiner : Minh Chau Thi PHAM
Docket : THOLAM P203US

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Dear Sir:

A claim for priority is hereby made under the provisions of 35 U.S.C. § 119 for the above-identified United States Patent Application based upon Canada Patent Application No. 2,430,510 filed May 30, 2003. A certified copy of said Canada application is enclosed herewith.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,


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Specification and Drawings, as originally filed, with Application for Patent Serial No:
2,430,510, on May 30, 2003, by **B.G.E. SERVICE & SUPPLY LTD.**, assignee of Darrel
Sutton, Arren Granville and Mike Benoit, for "A Method of Preventing Air Bypass in a
Filter Bank and a Filter Assembly".

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Agent certificateur/Certifying Officer

February 16, 2005

Date

Canada

(CIPO 68)
31-03-04

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ABSTRACT OF THE DISCLOSURE

A method of preventing air bypass in a filter bank and a filter assembly in accordance with the teachings of the method. Filter panels are inserted through an access opening 5 of a filter bank. As the filter panels are inserted they are connected in side by side relation with "I" shaped connectors. The sides of adjoining filter panels are inserted into opposed channels of the "I" shaped connectors. The positioning of the "I" shaped connector prevents air 10 bypass between the sides of adjacent filter panels.

TITLE OF THE INVENTION:

A method of preventing air bypass in a filter bank and a
Filter Assembly

5 **FIELD OF THE INVENTION**

The present invention relates to a method of preventing air bypass in a filter bank in which filters are positioned in side by side relation along a filter track, and a filter assembly constructed in accordance with the teachings of the
10 method.

BACKGROUND OF THE INVENTION

In filter banks, filter panels are inserted through an access opening into a filter track. The filter panels are
15 arranged along the filter track in side by side relation.

Air will always follow the path of least resistance. A problem presently being encountered with filter banks is that of air passing between the filter panels and bypassing the
20 filters altogether.

SUMMARY OF THE INVENTION

What is required is a method of preventing air bypass in filter banks, and a filter assembly constructed in accordance
25 with the teachings of the method.

According to a first aspect of the present invention there is provided a method of preventing air bypass in a
30 filter bank. A first step involves providing a filter bank having a filter track with an access opening. A second step involves providing rectangular filter panels. Each filter panel has an opposed pair of first sides, an opposed pair of second sides, two opposed faces, and a width between the two

opposed faces. A third step involves providing "I" shaped connectors having a length substantially the same as the length of the opposed pair of second sides of the filter panels. The "I" shaped connectors have opposed channels with an inner dimension substantially equal to the width of the filter panels. A fourth step involves inserting the filter panels through the access opening into the filter bank and sequentially connecting the filter panels in side by side relation with the "I" shaped connectors by placing the second sides of adjoining filter panels into the opposed channels of the "I" shaped connectors. The positioning of the "I" shaped connector prevents air bypass between the sides of adjacent filter panels.

According to a second aspect of the present invention there is provided a filter assembly which includes a filter bank having a filter track adapted to receive filter panels in side by side relation through an access opening. Rectangular filter panels are provided. Each of the filter panels has an opposed pair of first sides, an opposed pair of second sides, two opposed faces, and a width between the two opposed faces. "I" shaped connectors are provided having a length substantially the same as the length of the opposed pair of second sides of the filter panels and opposed channels having an inner dimension substantially equal to the width of the filter panels. The filter panels are connected in side by side relation by the "I" shaped connectors with the second sides of adjoining filter panels in the opposed channels of the "I" shaped connectors. The positioning of the "I" shaped connector prevents air bypass between the sides of adjacent filter panels.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more apparent from the following description in which reference is made to the appended drawings, the drawings are for the purpose of illustration only and are not intended to 5 in any way limit the scope of the invention to the particular embodiment or embodiments shown, wherein:

FIGURE 1 is a perspective view of the components necessary to assemble the filter assembly in accordance with the teachings of the present invention.

10 **FIGURE 2** is a top plan view of the filter panels being connected by "I" shaped connectors as they are inserted into the filter track of the side access filter bank.

15 **FIGURE 3** is a top plan view, in section, of a filter assembly in a side access filter bank in accordance with the teachings of the present invention.

FIGURE 4 is a side elevation detail view of an "I" shaped connector.

FIGURE 5 is a perspective view of a front loading filter bank.

20 **FIGURE 6** is an end view in sequence illustrating a filter being loaded in a back loading filter bank.

FIGURE 7 labelled as **PRIOR ART**, is a perspective cut away view of a filter assembly in a side access filter bank.

25 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

The preferred embodiment, a filter assembly generally identified by reference numeral 10, will now be described with reference to **FIGURES 1 through 5**.

30 Referring to **FIGURE 7**, there is illustrated a **PRIOR ART** filter assembly in a side access filter bank. The side access filter bank is generally indicated by reference numeral 200. Filter bank 200 has a filter track 202 (one with capacity for three filters has been selected for

illustration). Air flow is indicated by arrows 206. It is to be noted the air bypass which occurs between adjacent filter panels 204.

5 Structure and Relationship of Parts:

Referring to **FIGURE 1**, the components which make up filter assembly 10 are illustrated: a side access filter bank 12 having a filter track 14 with a single side access opening 16. Positioned in side by side relation along the filter track 14 are filter panels 18. Each filter panel 18 has an opposed pair of first sides 20, an opposed pair of second sides 22, two opposed faces 24, and a width 26 between the two opposed faces. In the illustrated embodiment, filter panels 18 are rectangular. "I" shaped connectors 28 having a length 30 substantially the same as the length of the opposed pair of second sides 22 of filter panels 18 and having opposed channels 32 having an inner dimension 34 substantially equal to width 26 of filter panels 18.

20

Operation:

The manner of assembly of filter assembly 10 in accordance with the teachings of the preferred method will now be described with reference to **FIGURES 1 through 4**.

25 Referring to **FIGURE 2**, each filter panel 18 is sequentially inserted into filter bank 12 through access opening 16. As each filter panel 18 is inserted, each second side 22 is fitted with an "I" shaped connector 28. Referring to **FIGURE 4**, "I" shaped connector 28 is adapted for a close tolerance fit with each second side 22 of each filter panel 18 such that inner dimension 34 and width 26 are substantially equal resulting in a complete seal. Referring to **FIGURE 3**, completed filter assembly 10 is shown. In the illustrated embodiment, "I" shaped connectors 28 are also used to seal

the ends of the chosen filter configuration. The overall result is that air flow, following the path of least resistance as indicated by arrows 36, is directed through filter panels 18.

5

Variation:

The above described innovation is not limited in its application to side loading filter assemblies, it is equally applicable to front or rear loading filter assemblies.

10 Referring to **FIGURES 5 and 6**, in the illustrated embodiment, filter tracks 38 are oriented so as to allow for front or rear loading. "I" shaped connectors 28 remain in close tolerance fit with filter panels 18. Referring to **FIGURE 6**, filter panel 18 is loaded (from left to right) by tilting and
15 installing upwards and then resting in place.

In this patent document, the word "comprising" is used in its non-limiting sense to mean that items following the word are included, but items not specifically mentioned are not excluded. A reference to an element by the indefinite article "a" does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be one and only one of the elements.

25 It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

5 1. A method of preventing air bypass in a filter bank, comprising of the steps of:

providing a filter bank having a filter track which receives filters in side by side relation inserted through an access opening;

10 providing rectangular filter panels, each filter panel having an opposed pair of first sides, an opposed pair of second sides, two opposed faces, and a width between the two opposed faces;

15 providing "I" shaped connectors having a length substantially the same as the length of the opposed pair of second sides of the filter panels and opposed channels having an inner dimension substantially equal to the width of the filter panels; and

20 inserting the filter panels through the access opening into the filter bank and sequentially connecting the filter panels in side by side relation with the "I" shaped connectors by placing the second sides of adjoining filter panels into the opposed channels of the "I" shaped connectors, such that the positioning of the "I" shaped 25 connector prevents air bypass between the sides of adjacent filter panels.

2. A filter assembly, comprising:

5 a filter bank having a filter track which is adapted to receive more than one filter arranged in side by side relation through an access opening;

rectangular filter panels, each of the filter panels having an opposed pair of first sides, an opposed pair of second sides, two opposed faces, and a width between the two opposed faces;

10 "I" shaped connectors having a length substantially the same as the length of the opposed pair of second sides of the filter panels and opposed channels having an inner dimension substantially equal to the width of the filter panels; and

15 the filter panels being connected in side by side relation with the "I" shaped connectors with the second sides of adjoining filter panels in the opposed channels of the "I" shaped connectors, such that the positioning of the "I" shaped connector prevents air bypass between the sides of adjacent filter panels.

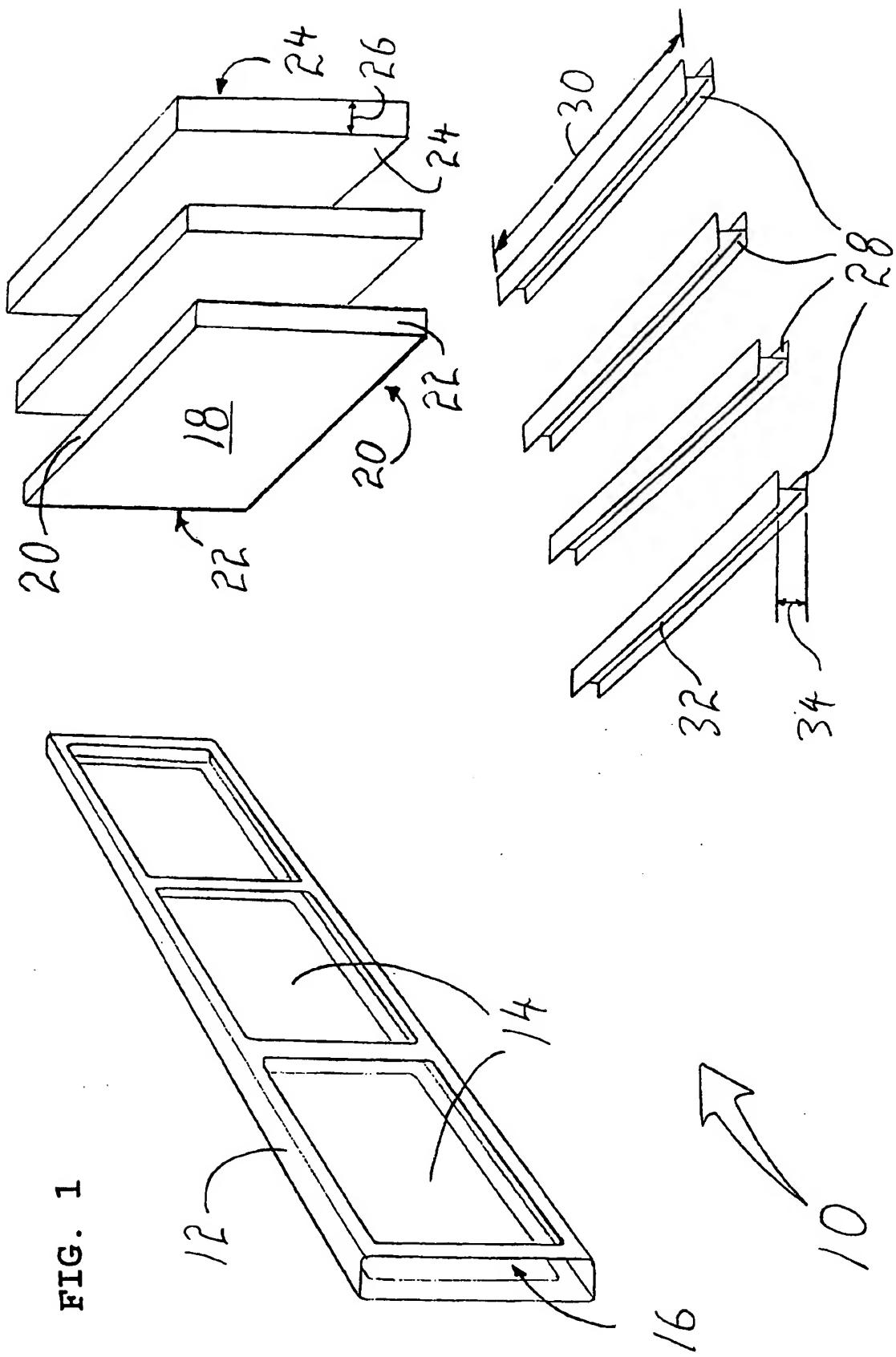


FIG. 2

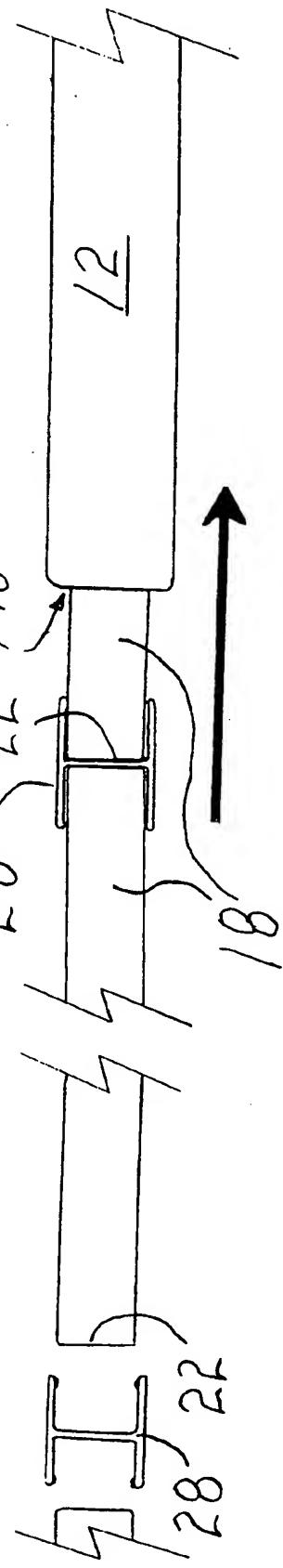
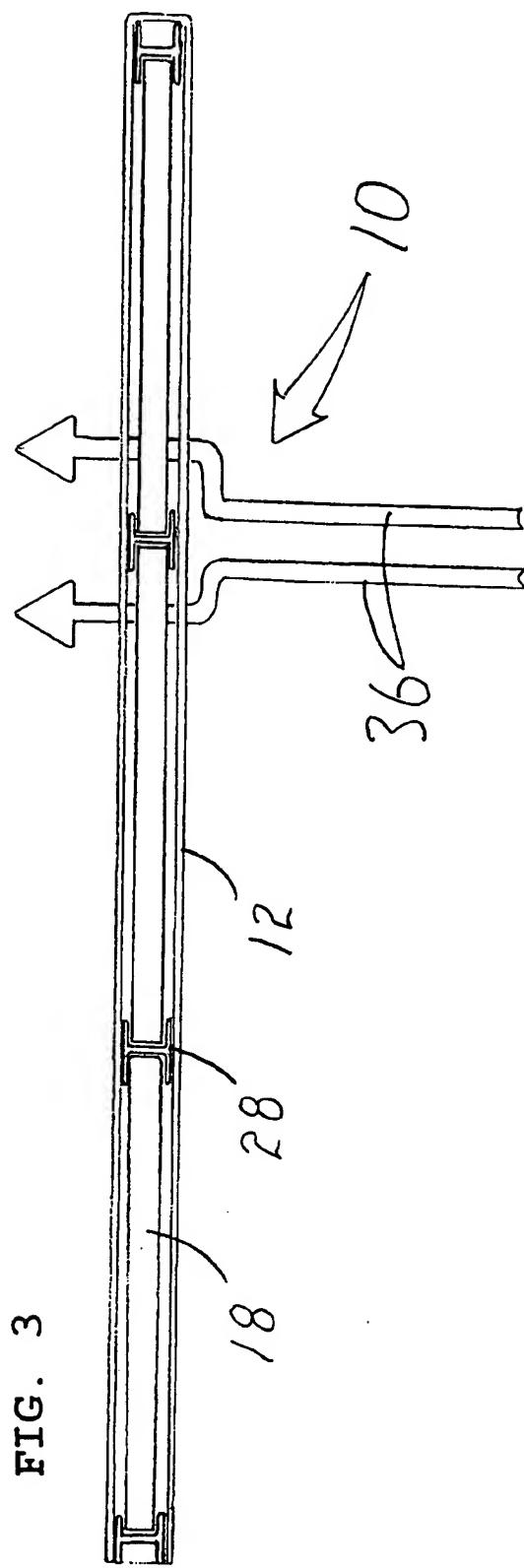


FIG. 3



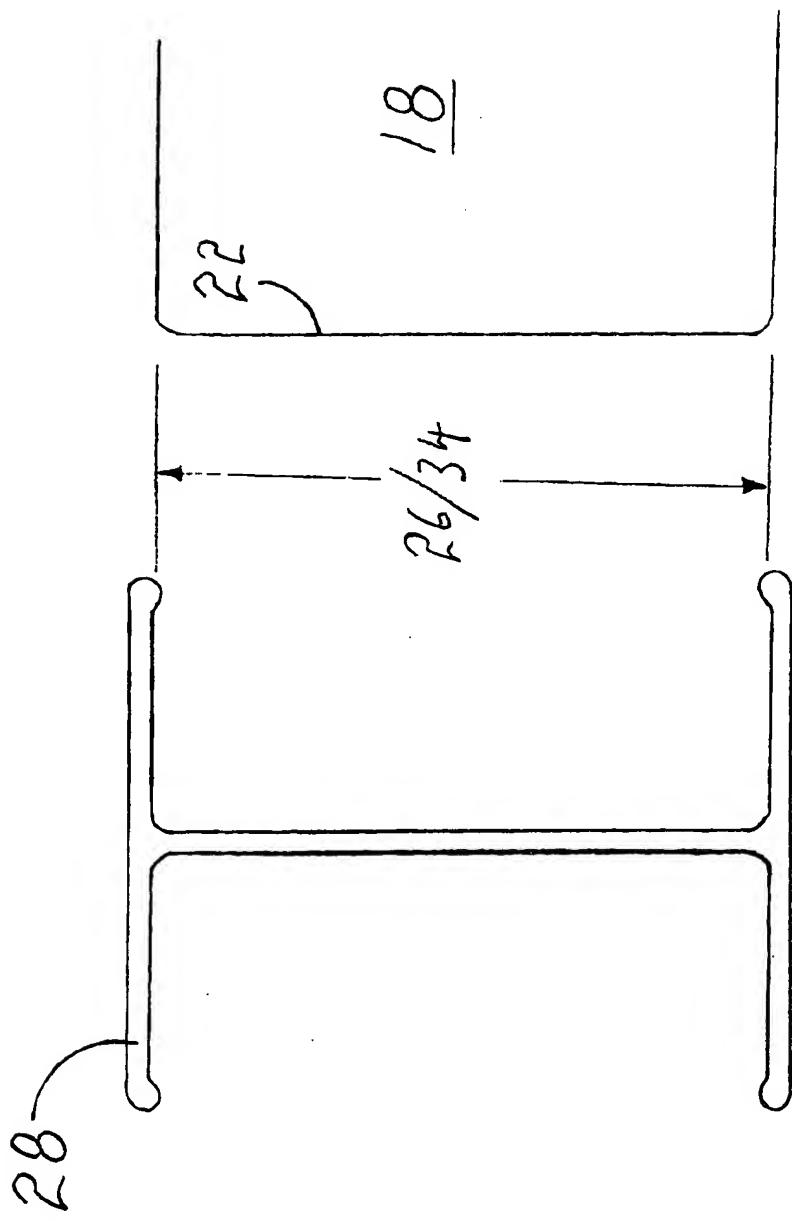


FIG. 4

FIG. 5

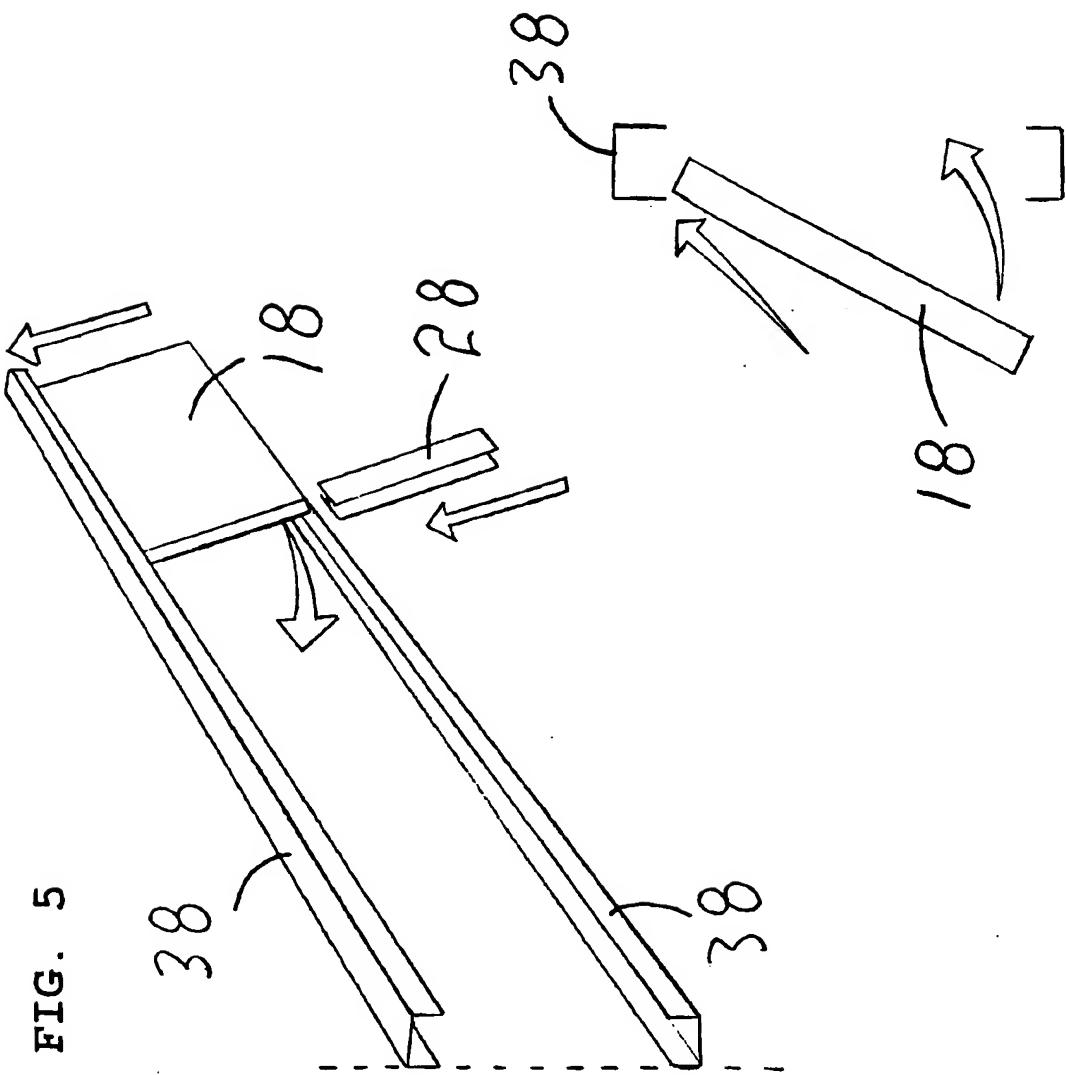


FIG. 6

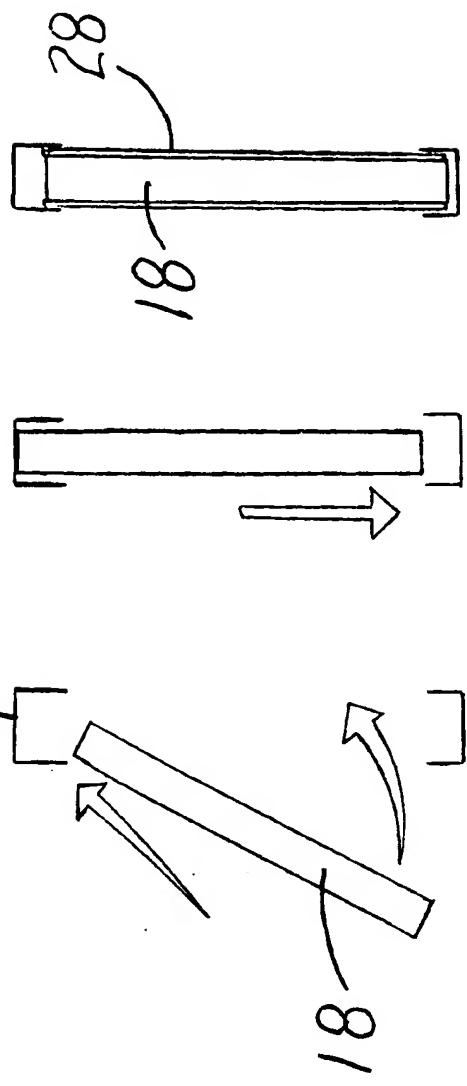


FIG. 7

